

**WHAT IS CLAIMED IS:**

## 1. Telephone line diagnostic equipment comprising:

a data detector configured for connection to a telephone line, wherein the data detector is configured to detect data provided on the telephone line and to provide signals representing the detected data at an output;

a telephone line terminator configured for connection to the telephone line, wherein the telephone line terminator terminates the telephone line in response to a termination signal received at an input, thereby causing an off-hook condition; and

a processor connected to the output of the data detector and the input of the telephone line terminator, wherein the processor monitors the signals provided at the output of the data detector for a Loop Test Message and provides a termination signal to the input of the telephone line terminator in response to the receipt of the Loop Test Message.

2. The equipment of claim 1 wherein the data detector is a frequency-shift key (FSK) detector.

3. The equipment of claim 2 wherein the data detected by the data detector on the telephone line is encoded in accordance with the GR-30 standard.

4. The equipment of claim 1 wherein the telephone line terminator comprises a resistor and a relay configured to terminate the telephone line with the resistor when the relay is energized by the termination signal.

5. The equipment of claim 1 wherein the processor is a microprocessor.

6. The equipment of claim 1 wherein the processor monitors duration of the termination signal to the input of the telephone line terminator.

7. The equipment of claim 6 wherein the processor ends the termination signal if the duration of the termination signal exceeds a predetermined length of time.

8. The equipment of claim 1 wherein the processor monitors the signals provided at the output of the data detector for a Stop Test Message and ends the termination signal to the input of the telephone line terminator in response to the receipt of the Stop Test Message.

9. The equipment of claim 1 further comprising a voltage detector configured for connection to the telephone line, wherein the voltage detector is configured to detect the voltage level the telephone line and to provide signals representing the voltage level at an output, and wherein the processor monitors the signals provided at the output of the voltage detector.

10. The equipment of claim 9 wherein the processor ends the termination signal to the input of the telephone line terminator in response to a signal representing an open switching interval provided at the output of the voltage detector.

11. The equipment of claim 9 wherein the processor ends the termination signal to the input of the telephone line terminator in response to a signal representing an extension telephone device going off-hook provided at the output of the voltage detector.

12. The equipment of claim 9 wherein the processor ends the termination signal to the input of the telephone line terminator when the output of the voltage detector indicates that the voltage level has dropped by more than 5% or 500mV, whichever is greater.

13. The equipment of claim 9 further comprising a dual tone multi-frequency (DTMF) generator connected at an input to the processor, and configured for connection to the telephone line, wherein the DTMF generator provides DTMF signals on the telephone line in response to signals received at the input from the processor.

14. The equipment of claim 13 wherein the processor causes the DTMF generator to send DTMF signals in response to a signal representing an extension telephone device going off-hook provided at the output of the voltage detector.

15. The equipment of claim 13 wherein the processor causes the DTMF generator to send DTMF signals when the output of the voltage detector indicates that the voltage level has dropped by more than 5% or 500mV, whichever is greater.

16. A method for evaluating a telephone line between a central location and a customer premises, the method comprising:

detecting data provided on the telephone line at the customer premises;

sending a Loop Test Message on the telephone line from the central location;

in response to a detected Loop Test Message on the telephone line at the customer premises, terminating the telephone line to cause an off-hook condition.

17. The method of claim 16 further comprising the steps of:

while the telephone line at the customer premises is off-hook, sending test signals from the central location on the telephone line, and receiving at the central location signals reflected back on the telephone line from the customer premises.

18. The method of claim 17 wherein the test signals are signals at a range of frequencies.

19. The method of claim 18 further comprising the step of performing a return loss measurement at the range of frequencies to determine aspects of the frequency response of the telephone line.

20. A telephony apparatus comprising:

detecting means, connected to a telephone line, for detecting a Loop Test Message signal sent by a remote loop testing server;

central processing means, connected to said detecting means, for measuring the time the loop test is activated;

hook switch means, connected to said central processing means, for terminating the line during the loop test;

voltage detecting means, connected to said central processing means, for measuring the voltage on the telephone line in order to determine if an extension telephone device is off-hook.

21. The telephony apparatus of claim 20 further comprising a telephone set, and wherein the loop test apparatus is included within the telephone set.

22. The telephony apparatus of claim 20 further comprising a Caller ID device, and wherein the loop test apparatus is included within the Caller ID device.

23. The telephony apparatus of claim 20 further comprising a computer modem, and wherein the loop test apparatus is included within the computer modem.

24. The telephony apparatus of claim 20 further comprising a computer-telephony interface board, and wherein the loop test apparatus is included within the computer-telephony interface board.

25. The telephony apparatus of claim 20 further comprising a telephone answering device, and wherein the loop test apparatus is included within the telephone answering device.

26. A method of interfacing with a loop test server comprising:

detecting a Loop Test Message signal sent by the loop test server;

detecting if extension telephone devices are off-hook;

terminating the telephone line with an impedance in order to connect the call back to the loop test server;

measuring the duration of the loop test.

27. The method of claim 26 wherein the method is performed by a telephone set.

28. The method of claim 26 wherein the method is performed by a caller ID device.

29. The method of claim 26 wherein the method is performed by a computer modem.

30. The method of claim 26 wherein the method is performed by a computer-telephony interface board.

31. The method of claim 26 wherein the method is performed by a telephone answering device.